

INFORMATION RESOURCES FOR THE FIRE COMMUNITY*

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SUMMARY

As information technology expands, information has become more readily available but the sources of this information have become more diverse. Within the field of fire research and engineering, it has become more challenging to find critical information because traditional sources of information have been augmented by a variety of electronic sources. Looking for specific information used to be performed by brute force, i.e., checking the library card catalog. With the explosion in computer communications, information retrieval has become an art form. Where does one look for information? While there are no "best" resources, the fire scientist or engineer must develop a familiarity with a wide range of old and new methods for acquiring information as well as staying abreast of latest developments. Success in the new world order of information science will go to the well informed user. An overview of print and electronic resources that are described in this paper can provide a starting point for responding to any information request.

THE TRADITIONAL PRINT SOURCES

Sources of printed material include textbooks, reports, journals, and handbooks. For the fire protection engineer and scientist, standard reference materials include handbooks published by the National Fire Protection Association (NFPA), such as the *Fire Protection Handbook*[1], the *SFPE Handbook of Fire Protection and Engineering*[2], the NFPA's *National Fire Codes*[3]. Along with these handbooks, the average fire protection engineer needs ready access to various regional building codes. This materials has always been available in a print format, and in some instances it is now available on CD-ROM (compact disk-read only memory). The change to a small format reflects the need to reduce printing costs and valuable shelf space.

Textbooks have been a continuing source of information for those working in engineering and science but there were none for the evolving fire protection discipline. A need existed to incorporate a body of data and analysis techniques for this emerging discipline. John Wiley & Son initiated a Fire Science Series to meet this demand. The maiden publication is the book by Drydale, *Introduction to Fire Dynamics*[4]. This is the only book in the series but there are several "in process."

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Over the past two decades the number of fire and fire research journals have expanded and contracted. The *NFPA Journal* was first called the *National Fire Protection Association Quarterly* and then *Fire Journal*. However, *Fire Journal* was combined with *Fire Command* to become the *NFPA Journal*. It is distributed to National Fire Protection Association (NFPA) members. *Fire Technology* also is distributed to NFPA members. The *Journal of Fire Protection Engineering* is distributed to Society of Fire Protection Engineers (SFPE) members. *Fire Protection* is distributed to the Fire Protection Association (FPA), London members.

There are other fire journals available directly from journal publishers: *Journal of Fire Sciences*, *Fire and Materials*, and the *Fire Safety Journal*. There also are a number of special interest bulletins generated by organizations. There are many titles in this area and the following titles illustrate this activity: *Fire and Flammability Bulletin*; *Fire Control Digest*; *Sprinkler Newsletter*.

For a comprehensive, but dated, list of sources for the fire practitioner, a 1990 article by Don Richardson entitled "Selective Guide to Literature on Fire Protection Engineering"[5] is illustrative.

TRADITIONAL ELECTRONIC SOURCES

Traditional electronic sources date back to the early 1970s with the introduction of bibliographic database systems and electronic Bulletin Board Systems (BBS). Bibliographic services digitized the printed format and made it available to subscribers electronically. Today electronic bibliographic services are provided by several companies: Knight-Ridder [formerly Dialog] (Mountain View, CA), Questel/Orbit, Inc. [formerly Orbit, Inc.] (McLean, VA), and CDP Online [formerly BRS] (New York, New York). These data systems allow access to many databases. Some databases that are very useful for the engineer and scientist are:

COMPENDEX PLUS*** (the Dialog name; the printed publication is *Engineering Index*) has abstracted information from the significant literature of engineering and technology. It covers approximately 4500 journals and selected government reports and books. Subjects covered include: automotive, biological, civil, energy, environmental and aerospace engineering, computers, industrial robots, and robotics. It is maintained by Engineering Information, Inc., Hoboken, NJ. The computerized database covers information from 1970 to the present.

CA SEARCH (the Dialog name; it is a condensed version of *Chemical Abstracts* with controlled vocabulary, CA General Subject Index Headings and CAS Registry Numbers). It has over 10 million citations in the chemistry literature and its applications. It is maintained by Chemical Abstracts Service, Columbus, OH. The computerized databases cover information from 1967 to the present.

NTIS has unclassified U. S. government-sponsored research, development, engineering, and analytical reports from 1964 to the present prepared by federal agencies, their contractors or grantees. Some state, local and foreign government agencies also contribute their reports. It is maintained by the National Technical Information Service, Springfield, VA.

RAPRA Abstracts (the print version also is called **Rapra Abstracts**) has abstracts on rubber, plastics, adhesives, and polymeric composites from 1972 to the present. It also has a large

*** Use of a trade name or a vendor in this publication does not imply endorsement.

collection of heavily indexed summaries of subjects covering technical, academic, commercial, and marketing aspects of the rubber and plastics industry. It is maintained by Rapra Technology, Ltd., Shropshire, UK.

U. S. Patents Fulltext includes the complete text of U.S. patents issued from January 1, 1974 to the present by the U.S. Patent & Trademark Office, Washington, DC, plus partial coverage of selected technologies from 1971 through 1973. The "full disclosure" portion of the patent includes exact details on the purpose, structure, and/or function of the device or substance.

NCJRS (National Criminal Justice Reference Service) database has bibliographic references from 1971 to the present on all aspects of law enforcement and criminal justice, including arson and police activities. It is maintained by the National Institute of Justice, Rockville, MD.

TOXLINE has bibliographic references from 1970 to the present covering the adverse effects of chemicals, drugs, and physical agents on living systems. It is a subset of the MEDLINE database, and there are several subsets on toxicology. It is maintained by the U.S. National Library of Medicine, Bethesda, MD.

Specialized bibliographic databases have been developed for fire research and related areas of interest. FIREDOC, the first United States database of this type, was created at the National Institute of Standards and Technology (NIST) in 1985 as a computer access system to the Fire Research Information Services (FRIS) literature collection. Today the database may be accessed with a computer and a modem or an Internet connection. FIREDOC contains approximately 50,000 references (including keywords and some abstracts) from fire research organizations throughout the world. The references are to reports, journal articles, conference proceedings, books, and audiovisual items. The cost to the user is the cost of the telephone call or the Internet charges.

In the United Kingdom the Building Research Establishment, Garston, has a bibliographic database, BRIX. FLAIR (fire database with references to the literature at the Fire Research Station) is part of BRIX. It can be searched independently or jointly. The contents and search features are similar to that of FIREDOC. The database is made available to subscribers for a fee through the ESA-IRS (European Space Agency-Information Retrieval Service) located in Frascati, Italy.

Bulletin board systems (BBS) were the first major information exchange medium in the fire community. The NIST BBS was established for the dissemination of technical information, making available the fire models developed at NIST. The FSBBS[6] (Fire Science Bulletin Board) is available 24 hours a day via direct dialing or downloading of files on the Internet at the Anonymous ftp site [candela.cfr.nist.gov](ftp://candela.cfr.nist.gov). Fire departments have been very active in this arena too. The ICHIEFS**** bulletin board is the most popular one in the United States. It is run by the International Association of Fire Chiefs[7]. There are setup and monthly charges associated with its usage. The British Chief Fire Officers (CACFOA) have a similar bulletin board service called FINDS.

Numeric databases are a little different. Fire Data Management System, FDMS 2.0[8] is a computer database containing fire test results which, in turn, can be retrieved for use with fire models. It contains small scale (e.g., cone calorimeter) fire test data, as well as large scale test data. This information will be incorporated into the HAZARD II fire model to assist the user, and made available by the Standard Reference Data Division at NIST.

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While many national fire protection organizations gather and summarize data. The NFPA's One Stop Data Shop is an example. Their information is derived from a number of sources: a U. S. fire department survey which is statistically designed to give an accurate overview; FIDO (Fire incident Data Organization) which provides in-depth information on firefighter fatalities and large loss or multiple fires; detailed records from the NFPA's fire investigations program; special subject investigations; and Federal Emergency Management Agency's National Fire Incident Reporting System (NFIRS).

THE INFORMATION SUPERHIGHWAY

The information superhighway or Internet system, a set of protocols designed to facilitate the interconnection of diverse computer systems, is an extension and expansion of the BBS concept. Using the Internet, researchers can more easily communicate with their peers via e-mail as well as more rapidly make available or disseminate information. The Internet has opened the door to the development of online journals, directories, catalogs, and discussion groups. The Library of Congress database is but one of the many large library collections that may be accessed. The address is telnet locis.loc.gov or gopher marvel.loc.gov. Many public libraries are offering Internet services (except e-mail) to their patrons. The costs are usually minimal. There also are a number of commercial services available, e.g., CompuServe, American OnLine, and Prodigy.

Jim Shanley (NAFI) has created FireE-mail Directory; it is a directory of fire personnel. To have a name added to the list or to obtain a copy, send an e-mail message to shanleyj@nafi.org or shanleyj@delphi.com.

DISASTER RESEARCH is a moderated bulletin board for creators and users of information regarding hazards and disasters. Each "issue" has a Table of Contents. Some recent items were: Developing a Data Base of Disaster Research, Projects, and Program; Researching Information Needs for HazMat Responders; Kobe II; Looking for People Interested in the Risks Associated with Wildland Fire Fighting. If you would like to subscribe, send an Internet message to: listproc@lists.colorado.edu. Send a one-line message in the body of your email: SUBSCRIBE HAZARDS <Your Name>. It also is available on bulletin boards in the United States (telephone: 202-646-2887) and Australia (telephone: + (054) 262-594).

FIRENET has current information about Australian landscape and wildland fires. It is designed for fire managers, fire researchers, and students. Its initial contents includes a bibliographic database, some software packages, current weather reports and imagery, and various documents, including source material and graphics for tertiary courses[9]. It is possible to access FireNet over the WWW. The address is http://life.anu.edu.au/landscape_ecology/.

The International Organization for Standardization (ISO) is online. It can be accessed over the WWW in English or French. The address is <http://www.iso.ch/welcome.html> (for the English version). It contains a catalog to all ISO International Standards including drafts. A search tool is provided to find information by keywords or by ISO reference number. It also has a complete list of ISO members and technical committees and other information.

Worcester Polytechnic Institute also is on WWW. A sampling of the sections: New Events, Fire Protection Engineering Courses, the Society of Fire Protection Engineers. There are many things of interest to many in the fire community. The address is <http://www.wpi.edu/depts/academic/cfs>.

For those unfamiliar with the Internet and WWW, sources of information include books[10], [11], professional groups and local libraries.

MULTIMEDIA RESOURCES

Multimedia resources are finding productive uses within the fire community. CD-ROM, the basis for most multimedia systems, has been adapted to a variety of fire applications. CD-ROM is the traditional medium for storage of large amounts of reports in order to save shelf space and ease the dissemination of collections of reports, such as a CD-ROM entitled *BFRL Publications, 1994* from the Building and Fire Research Laboratory at NIST. The search engine accompanying the BFRL CD-ROM is different than a bibliographic database as precision searching is not possible but, in turn, once identified the complete report (versus the bibliographic reference) is available for viewing and/or printing.

Fire researchers also have resorted to CD-ROM for the development of realistic fire fighter training. A carrier deck fire fighting curriculum is being developed by Hughes Associates for the U. S. Navy. "The curriculum consists of five CD-ROMs that familiarize the user with the carrier deck, flammable materials and ordnance, fire fighting team organization, fire fighting incidents, and crash and salvage procedures. During each scenario, the student fire fighter plays a variety of roles and makes the crucial decisions needed to bring the incident under control." [12]

Virtual reality is being used for training purposes in many disciplines. John Cater at Southwest Research Institute heads a project to produce a system called the Advanced Virtual Environment Real Time Fire Trainer [13]. This virtual reality program can train firefighters, including the sounds, sights and smells of the real experience. Currently it may run on a workstation and may not be economically feasible for one fire department, but a consortium of fire departments may be interested.

OTHER ELECTRONIC PRODUCTS

The National Fire Protection Association recently has announced the sale of the *1994 Life Safety Code (LSC)* and the *1994 National Electrical Code (NEC)* on computer disks. Both products will operate on an IBM or IBM-compatible PC with 512K RAM, DOS 3.0 or higher. The disks come with a built-in search engine that indexes every word in the document, thereby allowing for easy access to the information. To order a copy in the United States, telephone 800-344-3555.

GPS - Global Positioning System is becoming more available to the civilian sector. "GPS plays a major role in automatic vehicle location (AVL), a computerized display that plots the movement of a unit against an electronic map... The Federal Communications Commission has said it intends to require that longitude and latitude information be provided as an additional means of telephone address location. In addition to getting the traditional "1220 Main Street," dispatchers will have access to global coordinates through enhanced 911 systems. [14]" The British are using GIS (Geographic Information System) technology by showing maps of a brigade on a computer screen. Transparent to the user there is a fire cover model which will give the travel time and incident information, allowing the closest available piece of apparatus to be sent to the brigade. [15]

CONCLUSION

The overview has briefly discussed printed and electronic materials. The engineer and scientist may use all of these approaches or only one of them. The challenge is to maintain a comfort level in using these materials so that they work for the user.

REFERENCES

1. Cote, A. E. and Linville, J. L., Editors, *Fire Protection Handbook*, 17th edition, Quincy, MA, National Fire Protection Association, 1991.
2. DiNunno, P., Beyler, C. L., Custer, R. L. P., Walton, W. D., and Watts, J. M., Jr., Editors, *SFPE Handbook of Fire Protection Engineering*, Boston, MA, Society of Fire Protection Engineers, 1988.
3. National Fire Protection Association, *National Fire Codes; A Compilation of NFPA Codes, Standards, Recommended Practices and Guides*, Quincy, MA, National Fire Protection Assoc., 1994.
4. Drysdale, D., *Introduction to Fire Dynamics*, New York, John Wiley & Sons, 1985.
5. Richardson, D. G., "Selective Guide to Literature on Fire Protection Engineering", Engineering Literature Guide No. 11, Washington, D.C., American Society for Engineering Education, Washington, DC, 27 p., 1990.
6. Contact: Phyllis M. Martin, NIST, Building 224, Room A247, Gaithersburg, MD 20899
USA Tel: 301-975-6669, Fax: 301-975-4052, email: pmartin@enh.nist.gov
7. Contact: Information Management Center, IAFC, 4025 Fair Ridge Dr., Fairfax, VA 22033, Tel. 703-273-0911, ext. 333, Fax: 703-273-9363.
8. Portier, R. W., "Fire Data Management System, FDMS 2.0, Technical Documentation", NIST Technical Note 1407, Gaithersburg, MD, National Institute of Standards and Technology, 76 p., 1994
9. Green, D. G., Gill, A. M., and Trevitt, A. C. F., "FireNet; An International Network for Landscape Fire Information", *Wildfire*, Vol. 2, No. 4, December 1993.
10. Krol, E., *The Whole Internet; User's Guide & Catalog*, Sebastopol, CA, O'Reilly & Associates, 1992.
11. Sachs, D. and Stair, H., *Hands-On MOSAIC; A Tutorial for Windows Users*, Englewood Cliffs, NJ, Prentice Hall PTR, 1995.
12. Granito, J. A., "From Hoselines to Online", *NFPA Journal*, Vol. 89, No. 1, p. 78, January/February 1995.
13. Ibid, p. 77.
14. Furey, B., "Information 2000", *Firehouse*, pp. 54-55, February 1995.
15. Reynolds, C., "The Fire Cover Model on the Map", *Fire Research News*, Issue 18, pp. 7-8, Winter 1994.